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ABSTRACT

One of nine brief guides for special educators on using computer technology, this guide is specifically directed to special education teachers and encourages them to become critical consumers of technology to ensure its most effective use. Brief descriptions of the various uses of the computer in the school setting--as an instructional tool, as an administrative/management tool, and as a telecommunication device--are provided. Several suggestions for selecting software include previewing for such features as those that allow students to monitor and evaluate their own progress. Variations in computer input and output devices to make the machines accessible to students with various disabilities are briefly considered. Teachers are encouraged to become familiar with the hardware and its uses, enroll in an introductory computer course, learn to use a program with immediate use such as word processing, and determine how to integrate the computer with the curriculum. Suggestions for introducing students to the computer include involving parents, letting students with computer experience help other students, and establishing rules about using the equipment. The need for keyboarding skills is stressed. Lists of 10 readings, 4 organizational resources, 8 periodicals, and 5 guides to software resources are provided. (DB)

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Center for Special Education Technology

Tech Use Guide

Using Computer Technology

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Guide for Teachers

Today, a resource room class writes and publishes a professional looking newsletter with the help of a word processor. Students with visual impairments correspond electronically with pen pals across the country. Students with learning disabilities master math facts using a computer game. And special education teachers prepare IEPs and manage classroom instruction with the aid of a computer program.

Computers and other technology can create dynamic and exciting learning environments for the nation's four million students with disabilities. In fact, special educators have led the way with innovative and creative uses of technology in their classrooms.

However, with the increased availability of equipment and software come some hard decisions for educators regarding what technology to use and when to use it. Special educators must become critical consumers of technology to ensure it is used most effectively.

Computers for School Use

The computer in the school setting is used as an instructional tool, as an administrative and management tool, and as a telecommunication device linking distant sites together.

Instructional Uses: The predominant use of computers in special education classrooms is to present or reinforce the content of instruction. Computers are used to teach students new information and review already presented material. Tutorial software can introduce new skills or concepts. Drill and practice software can help students practice information already learned. Simulation software poses problem solving situations with no one correct answer, promoting critical thinking skills.

Educational Tools: The use of content-free software in educational settings is on the increase. Tool software can be used to find, organize, and present information. Word processing programs are the most popular tools. They allow students to write and revise stories and even publish their own books. Other tool software includes spreadsheet systems and database creation systems.

Administrative/Management Tools: Computers are used to manage special education programs and monitor student progress. Computer software can be used to write individual educational plans (IEPs). To do this, special educators either select goals and objectives from their district's database of items or create custom items for a particular child. Computer software can also be used to administer diagnostic tests and track instructional progress through an electronic grade book.

Telecommunications Devices: Computers can be linked together via the telephone. Users can send electronic mail to their counterparts in other classes, writing and editing message text with a purpose while improving language arts skills. Users can also tap on-line databases to research topics for independent study projects.

For any school use, the educator needs to determine whether technology is appropriate, given the instructional needs. Some points to remember:

- Technology is just one alternative that can be applied to a given learning situation. Traditional means are still needed to teach many academic and social skills. The challenge is to integrate technology in classroom instruction.
- Technology is expensive to use, both in time and money expenditures. Time is needed to acquire and analyze information and to try out options before a decision is made.
- There are many software and hardware products available. Some are good and some are inappropriate. It is important to identify the instructional need and match the product to the need.

Selecting Software

Much software, whether labeled special education or regular education, can be used successfully with learners with disabilities if it is carefully matched to the student and his/her instructional goals.

First, the educational objectives for the student should be analyzed. Is instruction needed to present new material, practice skills to achieve mastery, or review knowledge gained?

Next, the software needs to be previewed to determine if it does, in fact, match the instructional needs. Some software characteristics are particularly effective for students with disabilities, for example:

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EC 233193

- Presentations that provide step-by-step strategies for performing a task and guiding students through each of the steps;
- Features that allow students to monitor and evaluate their own progress, such as built in charts to graph student progress;
- Feedback that provides clear and helpful error correction, rather than gives responses that are judgmental or vague; and
- Rewards that are related to completion of the task, such as promotion from "rookie" to "detective." Students soon lose interest in rewards that are merely flashy graphics.

When selecting software, colleagues may suggest programs they use and like. School districts often have lists of approved software and preview centers to review software prior to use. Computer magazines and professional journals usually have regular sections devoted to reviews of the latest software. Sometimes special articles focus on a type of software and compare several programs. All of these resources are useful when making decisions about programs to use in classroom instruction.

Computer Input and Output Devices

Some students with disabilities are not able to use the standard computer keyboard to enter information into the computer, or will need some alternative output device to receive information from the computer. A variety of equipment can be added to the basic microcomputer to tailor the machine to fit students needs.

To input information, keyboards can be simplified so there are fewer keys. The keyboard can even be bypassed so the student merely touches the computer monitor screen to indicate responses. Simple switches can be activated using eye gaze recorders and headsticks to input information. Speech recognition devices can accept verbal commands.

The output of information can also vary. Information can be displayed in a standard video display unit. However, output can also be provided by print, Braille, synthesized speech, telecommunications, and physical actions, such as the control of robots and other electrical appliances.

An adaptive firmware card installed in the microcomputer will translate single switch input and simplified keyboard commands into standard keyboard information so that the computer reads the input as if it were entered from a regular keyboard. The card allows the student with physical impairments to use existing software packages with only minor modifications. This increases the amount of material available to the student.

The task of matching appropriate input/output devices to the needs of students presents a challenge to educators. Fortunately schools, social service agencies, and private clinics provide personnel who are trained to assess the needs of students with disabilities and recommend solutions that take advantage of new technologies. Some companies that specialize in marketing these devices also provide assistance through trained dealers who offer information and continuing support for their equipment.

Many resource centers at the local school district level and state level have device collections and offer training on how to use them. Often these centers provide students with the opportunity to try the aids and learn first-hand which of the devices are most useful.

Where to Begin

Interested and enthusiastic teachers are the key to successful integration of the computer in the classroom. With some basic information and skills, a teacher can involve students in positive computer learning experiences.

- Become familiar with the hardware and its many uses. Some teachers prefer to experiment on their own at first. If there is a machine at your school, sit down and experiment. Computers are pretty durable. You aren't likely to do any lasting damage. If a tutorial program comes with the micro, try it out. These programs generally provide an overview of the machine and its many features. Another approach is to find a colleague who uses computers and ask for a demonstration.
- Enroll in an introductory computer course. Your school district may offer inservice courses or have a computer specialist who can advise you. Some states have regional centers that offer workshops. Many community colleges, libraries, and computer stores offer training. Unless you plan to develop your own software, don't start with a course on computer programming.
- Learn to use a program that has immediate use. Many beginners find that the best place to start is with an "application program," such as word processing, electronic spreadsheet, database management, graphics, or telecommunications. Learning to use a word processing program may serve two purposes. Not only will it give you a tool for your own writing tasks, it may also lead to some creative uses of computers with your students.
- Determine how to integrate the computer with your curriculum. Computers are most effective if they are part of the ongoing instructional program. Based on your needs analysis, identify curriculum areas that can be supplemented through the use of the computer. Think about how you will use the computer in your classroom. Start slowly and gradually increase the use of the computer as your confidence builds.

Introducing Students to the Computer

While most children are curious about computers, they need guidance as they learn to use the technology. There

are a number of things that can be done to make students' initial computer experiences positive and to let children know how the computer plays a role in learning.

- Take an informal survey in your classroom to find out how many of your students have used a micro and their level of expertise. Students who have some experience may be able to tutor others.
- Involve the parents of your students. Many homes have personal computers and involving parents may be an excellent way to encourage learning at home. You may even find that interested parents have skills that benefit you and your students.
- Students should have a few lessons about the computer before they sit down in front of the machine. First, explain to them what the computer is and discuss their expectations. Let students who have used micros talk about their experiences.
- Develop rules about the equipment. Two basic rules are no food near computers and no magnets, pens, or other sharp metals near the disks. Discuss the reasons for these rules. With older students, talk about copyright issues. Let them know when they can copy programs and when it is not allowed. Determine how the computer will be used and when each child will use it. Devise a sign-in policy and develop time limits.

Develop Keyboarding Skills

If computers will be used as a regular part of the curriculum, keyboarding skills should be taught. Students will be less frustrated if they are familiar with the keyboard, know where the keys are, and how the special function keys work. A good keyboarding curriculum is one that teaches the skills students need to use for the software selected. For some programs, students may need to use only a few function keys or enter one-letter responses. For other programs, students may need touch typing skills. There are many excellent programs on the market designed to improve keyboarding skills.

Used with care, computers and other instructional technology can enrich the educational environment for special needs students. Teachers play a critical role in ensuring that technology is used effectively.

Readings

Becker, H. J. (1987). The impact of computer use on childrens' learning: What research has shown and what it has not. Baltimore, MD: Center for Research of Elementary and Middle Schools, The Johns Hopkins University.

Behrmann, M. M. (Ed.). (1984). Handbook of microcomputers in special education. San Diego, CA: College-Hill Press.

Behrmann, M. M. (Ed.). (1988). Integrating computers into the curriculum: A handbook for special educators. Boston: College-Hill Press.

Ellis, E. S. & Sabornie, E. J. (1986). Effective instruction with microcomputers: Promises, practices, and preliminary findings. Focus on Exceptional Children, 19(4).

Hagan, D. (1984). Microcomputer resource book for special education. Reston, VA: Reston Publishing Company, Inc.

Hasselbring, T. S., Goin, L. I., & Bransford, J. D. (1988). Developing math automaticity in learning handicapped children: The role of computerized drill and practice. Focus on Exceptional Children, 20(6), 1-7.

Morocco, C. C., & Neuman, S. B. (1986). Word processors and the acquisition of writing strategies. Journal of Learning Disabilities, 19(4), 243-247.

Torgesen, J. K. (1986). Computers and cognition in reading: A focus on decoding fluency. Exceptional Children, 53, 157-162.

White, L. R. (1987). Administrative guidelines for the implementation of technology in special education. Reston, VA: The Council for Exceptional Children.

Woodward, J. P., & Carnine, D. W. (1988). Antecedent knowledge and intelligent computer-assisted instruction. Journal of Learning Disabilities, 21, 131-139.

Resources

Association for Educational Communications and Technology (AECT), 1126 16th Street, NW, Washington, DC 20036

International Association for Computing in Education (IACE), 1230 17th Street, NW, Washington, DC 20036

International Council for Computers in Education (ICCE), University of Oregon, 1787 Agate Street, Eugene, OR 97403

Technology and Media (TAM) Division of The Council for Exceptional Children, 1920 Association Drive, Reston, VA 22091

Periodicals

The Catalyst, Western Center for Microcomputers in Special Education, 1259 El Camino Real, Suite 275, Menlo Park, CA 94025.

Classroom Computer Learning, 2451 East River Road, Dayton, OH 45439.

Closing The Gap, P.O. Box 68, Henderson, MN 56044.

Computer Curriculum Resources, Learning Publications, Inc., P.O. Box 1326, Holmes Beach, FL 34218-1326.

The Computing Teacher, Department of Computer & Information Science, University of Oregon, 1787 Agate Street, Eugene, OR 97403.

Electronic Learning, Scholastic, Inc., P.O. Box 2041, Mahopac, NY 10541.

Journal of Special Education Technology, Peabody College at Vanderbilt, Box 328, Nashville, TN 37203.

Teaching and Computers, Scholastic, Inc., P.O. Box 2040, Mahopac, NY 10541.

Software Resource List

The 1989 Closing The Gap Resource Directory, Closing The Gap, P.O. Box 68, Henderson, MN 56044; 612-248-3294, $14.95.

The 1989 Survey of Early Childhood Education, High/Scope Education Research Foundation, 600 North River Street, Ypsilanti, MI 48198, 313-485-2000; $19.95.

Only the Best: The Discriminating Guide for Preschool - Grade 12, Education News Service, P.O. Box 1789, Carmichael, CA 95609, 916-483-6159; $21.95.

Software to Go, Software Evaluation Clearinghouse for Educators of the Hearing Impaired (SECHI), Gallaudet Bookstore, Gallaudet University, Kendall Green, P.O. Box 300, Washington, DC 20002, 800-672-6720; $7.50 plus postage.

The Specialware Directory: A Guide to Software for Special Education, LINC Associates, Inc., 3857 North High Street, Columbus, OH 43214.

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Additional **Tech Use Guides** on the following topics are available from the Center upon request:

- Guide for Parents
- Guide for Disabled Adults
- Computer Access
- Selecting Software
- Selecting Hardware
- Preschool Children
- Learning Disabilities
- Hearing Impairments
- Physical Disabilities
- Visual Impairments
- Telecommunication Networks
- Augmentation Communication

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